

Microsoft Excel Session 2:

FORMATS & FUNCTIONS

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Tonight:

- Review Formulas
- Text and Number Formats
- Absolute vs. Relative References
- What is a Function?
- The IF Function
- The PMT Function
- The Most Important Spreadsheet

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REVIEW OF LAST SESSION

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Excel Session 2 Workbook

- Download from class website
- Review: Homework 1
- Review: Checkbook register
- Review Formulas
- Parentheses: When to use them

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The "F" Word: **Formulas**

Four Rules:

1. Always begin with "="
2. Use cell addresses, **not** numbers
3. Check formulas
4. Similar cells → similar formulas

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Cell Addresses or References

- 2 ways to enter cell references:
 1. Type the cell reference (e.g., "B3")
 2. Or Click the cell with the mouse

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Which Formula Is Better?

A: = D7+E7

B: =(D7+E7)

Parentheses Not Needed Here

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What's Wrong with This?

= B7-C7 / C7

Subtraction Should Occur First

8

Which Operation Comes First?

Add? Subtract? Multiply? Divide?

Multiplication *OR* Division

Then

Addition *OR* Subtraction

Whichever Comes First in the Formula

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Parentheses (in Formulas)

- Not always required
- Tells Excel what to do first

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Evaluating Formulas

	A	B	C
1	50	10	5

- 1) $=A1+B1*C1 \rightarrow 100$
- 2) $=(A1+B1)*C1 \rightarrow 300$
- 3) $=A1/B1-C1 \rightarrow 0$
- 4) $=A1/(B1-C1) \rightarrow 10$
- 5) $=A1/B1*C1 \rightarrow 25$

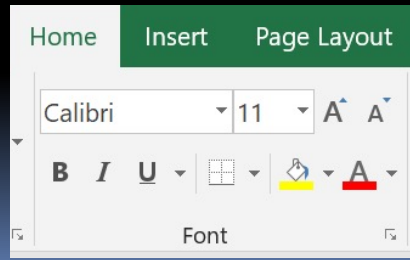
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FORMATS

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The Font Group

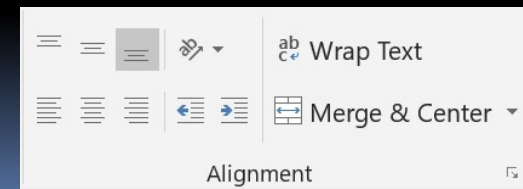
- Font Size
- Bold/Italic
- Fill Color
- Font Color
- Borders
- Launch



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The Alignment Group

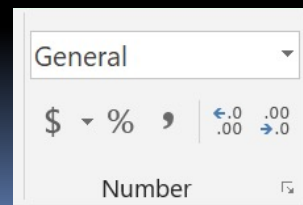
- Top/Bottom
- Left/Right
- Orientation
- Increase Indent
- Wrap Text
- Merge & Center



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The Number Group

- Format List
- Accounting (\$)
- Comma
- Increase Decimals
- Launch



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The Easiest Way to Format Cells?

Copy the format

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2 Ways to Copy a Format

1. Format Painter button



2. Or Copy & Paste Formatting

- Copy desired cell format
- Click ▼ of Paste
- Select button for Formatting

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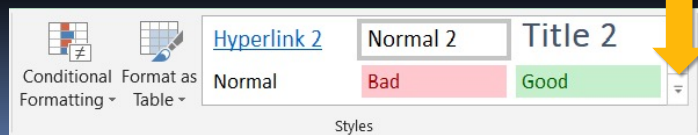
The 2nd Easiest Way to
Format Cells?

Use a Style

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The Styles Group

- Conditional Formatting
- Format as Table
- Styles
- The "More" button



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CELL STYLES

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Cell Styles

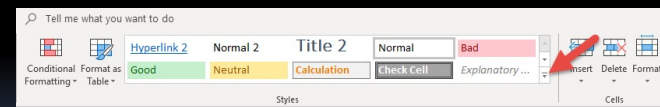
- Quick and consistent formats

	A	B	C	D	E	F	G	H
1	Semi-Annual Budget							
2	The Wilson Family							
3								
4	Income							
5	Person	Jan	Feb	Mar	Apr	May	Jun	Total
6	Rachael	2,600	2,600	2,600	2,600	2,600	2,600	15,600
7	Jeremy	1,700	1,700	1,700	1,700	1,700	2,300	10,800
8	Total	4,300	4,300	4,300	4,300	4,300	4,900	26,400
9								
10								

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How to Apply a Cell Style

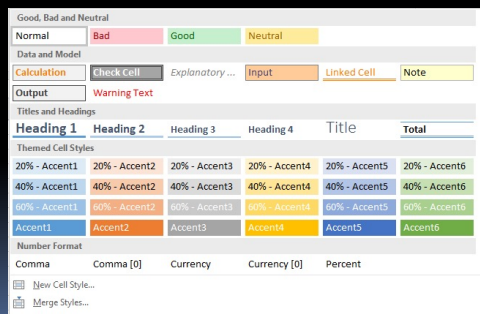
- Click: Home > Cell Styles (or the *More* button)



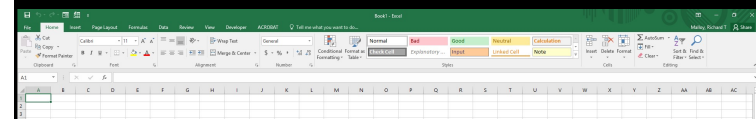
22

How to Apply a Cell Style

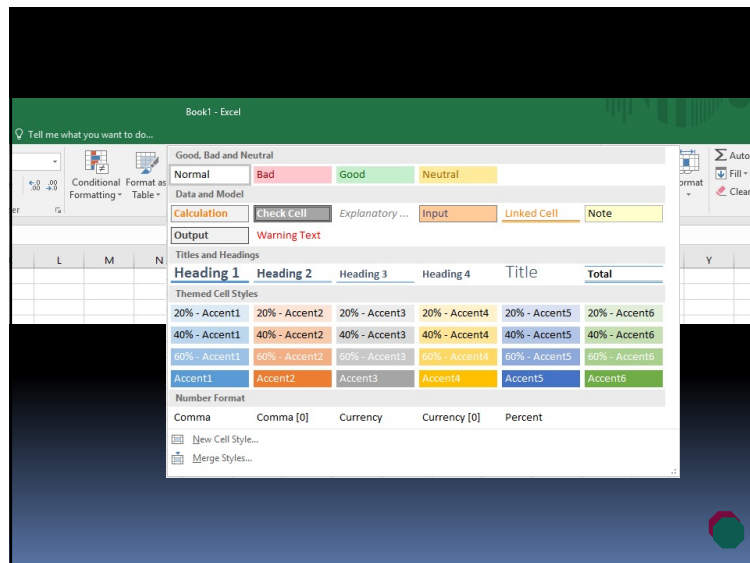
- Choose the desired Style



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Conditional Formatting

- Special Formatting for certain values
- E.g.: Negative numbers are **Red**
- Procedure:
 - Select a range of cells
 - Click: Home > Conditional Formatting
 - Click: Highlight Cell Rules
 - Click: Greater Than ...
 - Set: greater than: 800
 - Click: OK

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Question:
How Do We Know Where the
Formulas Are?

Two Ways:

1. Find & Select > Formulas
2. Or Formulas > Show Formulas

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Hiding Columns & Rows

- Too much detail may be confusing
- Procedure:
 - Right-click column letter (or row number)
 - Choose: Hide
- To Unhide:
 - Right-click and choose: Unhide

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Custom Date Format Codes	
Format Code	Result
▪ m/d/yy	▪ 3/4/19
▪ mm/dd/yyyy	▪ 03/04/2019
▪ mmm d	▪ Mar 3
▪ mmmm d	▪ March 3
▪ ddd	▪ Tue
▪ dddd	▪ Tuesday

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ADVANCED FORMULAS

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ABSOLUTE VS. RELATIVE

NOT
It's All Relative
^

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Relative vs. Absolute

Relative Reference

- Same row or Same column
- "Local call"
- Address changes if formula copied

Absolute Reference

- Different row and column
- "Long distance"
- Address never changes

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In Excel

Relative Reference

- Example:
=A3+B3
- Simple
- Copy 1 row down:
=A4+B4

Absolute Reference

- Example:
=\$A\$3+\$B\$3
- Uses \$ sign
- Copy 1 row down:
=\$A\$3+\$B\$3

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A MNEMONIC:

Ab\$olute Reference



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Tale of Two Vodkas

- What's the difference between these?



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LET'S HAVE SOME ...

FUNCTIONS

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WHAT'S THE FUNCTION OF FUNCTIONS?

To Make Formulas Easy

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Simplify:

	A	B	C	D	E
1	50	30	10	20	25

~~=A1+B1+C1+D1+E1~~

=SUM(A1:E1)

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Simplify:

	A	B	C	D	E
1	50	30	10	20	25

~~=(A1+B1+C1+D1+E1)/5~~

=AVERAGE(A1:E1)

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Function Fundamentals

Parentheses **ALWAYS** required

=SUM(B3,B4,C5:C7)

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Function Fundamentals

Arguments between parentheses

=SUM(B3,B4,C5:C7)

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Function Fundamentals

A Range of Cells is considered as a single argument

=SUM(B3,B4,C5:C7)

Commas between arguments

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Function Fundamentals

=SUM(B3,B4,C5:C7)

Usually all
CAPS

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Functions Often Use a **Range**



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Functions Often Use a **Range**

- A group of cells
- Indicated by a colon (:)
- A1:D4

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Using Functions

- Over **350** functions!
- Examples: **SUM()**, **AVERAGE()**, **IF()**
- **ALWAYS** have parentheses
- Some functions have no arguments!
- Need help? Press **Insert Function** button:



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Evaluating Functions

	A	B	C
1	20	40	60

- | | | |
|--------------------|---|-----|
| 1) =SUM(20,40) | → | 60 |
| 2) =SUM(A1,B1) | → | 60 |
| 3) =SUM(A1:C1) | → | 120 |
| 4) =AVERAGE(A1:B1) | → | 30 |

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Special Functions

Let you do things otherwise impossible

- Find the smallest number in a group
- Count the numbers in a group
- Return today's date
- *And many, many more*

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The MIN & MAX Functions

=MIN(B2:B5)

Finds the **minimum** value in the cells B2, B3, B4, and B5

=MAX(B2:B5)

Finds the **maximum** value in the cells B2, B3, B4, and B5

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COUNT & ROUND Functions

=COUNT(B2:B5)

Counts how many cells in range have numbers

=ROUND(3.14163,1)

Rounds off to desired decimal places
Here, the result is **3.1**

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Using Date Functions

=TODAY()

Returns today's date

Note: No Arguments

=NOW()

Returns today's date *and* time

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Evaluating Functions

	A	B	C
1	20	40	60

- | | | |
|------------------|---|------|
| 1) =MIN(A1:C1) | → | 20 |
| 2) =MAX(A1:C1) | → | 60 |
| 3) =COUNT(A1:C1) | → | 3 |
| 4) =TODAY() | → | 3/02 |

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DysFunctional Functions

How to Screw Up a Function:

- Missing parentheses
- Using + instead of commas
- Using the wrong arguments
- Wrong number of arguments
- Misspelled function name

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The Sales Report Sheet

- Fill in the yellow cells
- Use: SUM, AVERAGE, MAX
- Use Absolute References for % of Total

Weekly Sales Report										
Weeks 1-20										
Item	Burke	Chen	Clarke	Gonzalez	Pattinson	Serratos	Stewart	Total	% of Total	Average
Week 1	2733.40	2465.20	2687.12	1872.72	2569.91	705.55	2336.42			
Week 2	875.71	1008.83	1314.19	1829.20	715.98	2363.61	886.33			
Week 3	2765.69	1423.79	1589.42	1527.94	1332.56	1313.96	2706.68			
Week 4	1216.27	1391.86	2417.00	942.36	1550.55	1594.21	2997.99			
Week 5	1487.79	875.41	1052.08	2558.46	1338.77	1538.95	1639.32			
Week 6	2281.52	1094.35	2046.25	1287.79	2397.35	2489.93	1670.14			
Week 7	1131.39	1079.71	2462.43	913.27	629.02	1793.48	1866.78			
Week 8	2797.29	2694.20	1072.36	1060.81	760.39	2699.98	2978.95			
Week 9	975.44	2981.63	2358.14	1310.66	2862.76	1790.13	1232.82			
Week 10	1427.72	2945.41	2232.70	1863.77	1586.45	851.66	1534.24			
Week 11	1933.97	1024.54	1911.97	2372.51	2593.77	1263.68	2412.81			
Week 12	2032.67	1792.07	1796.69	971.33	953.54	997.33	2022.30			
Week 13	1467.46	2532.25	987.54	1928.88	561.60	2584.45	2828.25			
Week 14	2743.14	2123.06	1233.89	2977.55	1550.40	2779.98	2070.07			
Week 15	2141.85	2584.26	547.74	2296.97	2892.64	2924.67	1070.48			

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Printing: How to Fit a Worksheet on Paper

- Set Print Area
- Reduce Margins
- Landscape Orientation
- Scale to Fit on 1 page width
- Repeat Column Headers (Print Titles)

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Page Headers & Footers

- Help to Identify the worksheet
- Insert a Header:
 - Buttons for: File Name, Sheet Name
- Insert a Footer:
 - Type your name
 - Buttons for: Current Date, Page Number

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THE IF FUNCTION

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Can Return Two Values

- Sales Tax:
 - If State = "CT" then 6.35%
 - Else 0%
- Special Car Rebate:
 - If Type = "Electric" then \$7,500
 - Else \$0

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Using the IF Function

`=IF(Condition, If-True, If-False)`

`=IF(B4="CT",6.35%,0%)`

E.g., Condition: B4="CT"
 If-True: 6.35%
 If-False: 0%

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Evaluating the IF Function

	A	B	C
1	CT	40	60

1) `=IF(A1="CT",6.35%,0%)` → 6.35%

2) `=IF(B1>C1,"Yes","No")` → "No"

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Uses for the IF Function

- Assigning different commission rates
- Assigning different sales tax rates
- Assigning shipping charges

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How to Buy Things

FINANCIAL FUNCTIONS



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What Will a Loan Cost Me?

Two ways to find out:

1. Call a bank
2. Use the Excel PMT (Payment) function

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Using the PMT Function

Very useful for calculating **loan payments**

=PMT(IntRate/12, Years*12, -Amount)

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Using the PMT Function

Example:

Interest rate = 8%

Years = 4

Amount = 10,000

Payment = $\text{PMT}(8\%/12, 4*12, -10000)$
= 202.76

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Can You Find the Mistakes?

	A	B	C
1	Interest	Years	Principal
2	5.5%	30	200,000

=PMT(A2, B2, C2)

Must multiply
Years by 12

Must divide annual
rate by 12

Amount usually
is minus

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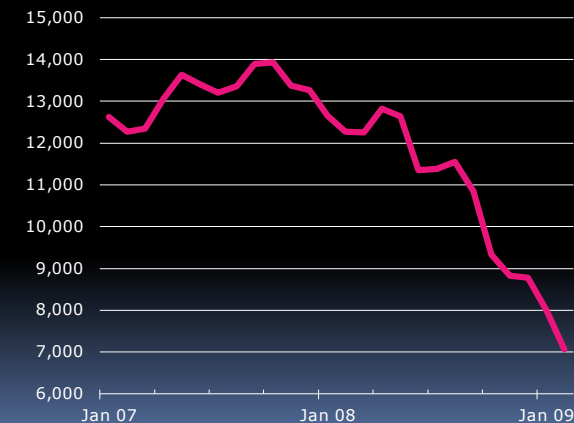
PMT Corrected

	A	B	C
1	Interest	Years	Principal
2	5.5%	30	200,000

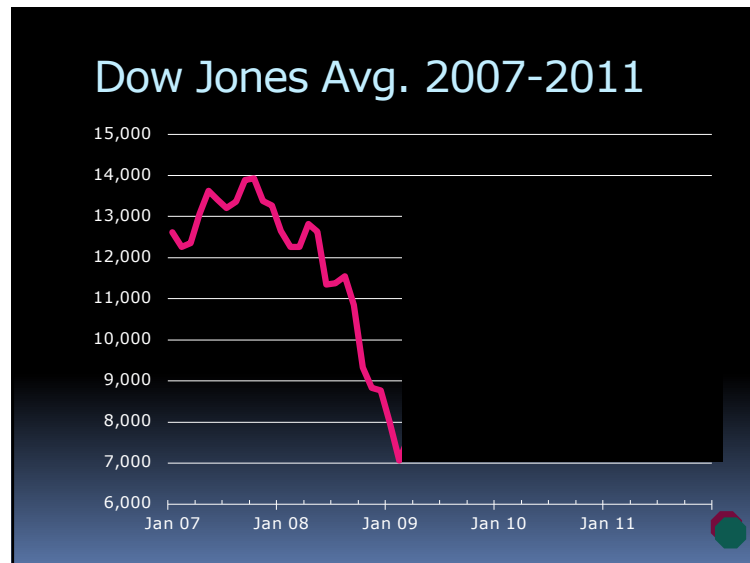
=PMT(A2/12, B2*12, -C2)

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Dow Jones Industrial Avg.



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BUDGETS

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Budgets

The most important spreadsheet you will create

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What Is a Budget?

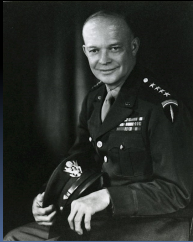
- A plan for income and expenses

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The Value of a Plan

Plans are worthless, but planning is everything.

-- Dwight D. Eisenhower



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Homework

- Create your own personal budget
- Try to use your real estimates
- The more accurate you make it
 - The more you will get from it

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REVIEW

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What Do Functions *Always* Have?

- A. Commas
- B. Colons
- C. Parentheses
- D. Cell References

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If You Copy `=C3+B2` Down One Row, What Do You Get?

A. `=C3+B2`

B. `=C4+B2`

C. `=C4+C3`

D. `=C3+B3`

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What Function Do You Use for a Mortgage Payment?

A. `PAYMENT()`

B. `PMT()`

C. `MORTGAGE()`

D. `PAY()`

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THE LAWS OF EXCEL FORMULAS

- I. START WITH AN EQUAL SIGN.
- II. NO NUMBERS; USE CELL REFERENCES.
- III. CHECK FORMULAS BY ESTIMATING.
- IV. SIMILAR CELLS, SIMILAR FORMULAS.
- V. REMEMBER: LONG-DISTANCE CELL REFERENCES ARE \$ (EXPENSIVE).

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Next Week:

- Databases

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